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CLAIMS

[Claim(s)]

[Claim 1] The semiconductor device characterized by providing or including the following. The gray dead silicon germanium layer which germanium composition increases on a silicon germanium substrate, the active layer which makes germanium a principal component, and the gray dead silicon germanium layer in which germanium composition decreases. V group element is many [1 to 2%] III-V group compound semiconductor layers, and a III-V group compound semiconductor active layer to a stoichiometry to the field which adjoins the field in which this aforementioned p type transistor was prepared at least while constituting the p type transistor which uses the aforementioned silicon germanium active layer as a channel layer to a field in part. n type transistor which uses the aforementioned III-V group compound semiconductor active layer as a channel layer.

[Claim 2] The semiconductor device according to claim 1 with which the above-mentioned silicon germanium substrate, the gray dead silicon germanium layer which the above-mentioned germanium composition increases, the active layer which makes the above-mentioned germanium a principal component, and the gray dead silicon germanium layer in which the above-mentioned germanium composition decreases are characterized by having germanium composition which the misfit transition by grid mismatching does not generate.

[Claim 3] The semiconductor device according to claim 1 or 2 characterized by germanium composition of the above-mentioned silicon germanium substrate making it 0.3 or 0.7.

[Claim 4] A semiconductor device given in the claim 1 characterized by for the active layer which makes the above-mentioned germanium a principal component being a germanium active layer whose germanium composition is 100%, and the above-mentioned III-V group compound semiconductor active layer being a GaAs active layer, or any 1 term of 3.

[Claim 5] A semiconductor device given in the claim 1 characterized by for the above-mentioned p type transistor being an insulated-gate type electric field effect type transistor, and n type transistor being an HEMT, or any 1 term of 4.

[Claim 6] The gray dead silicon germanium layer which germanium composition increases on a silicon germanium substrate, The active layer which makes germanium a principal component, the gray dead silicon germanium layer in which germanium composition decreases, V group element receives a stoichiometry. Many [1 to 2%] III-V group compound semiconductor layers, And a III-V group compound semiconductor active layer is prepared. After exposing the gray dead silicon germanium layer in which the aforementioned III-V group compound semiconductor active layer and the aforementioned V group element remove alternatively many [1 to 2%] III-V group compound semiconductor layers to a stoichiometry, and germanium composition decreases, The manufacture method of the semiconductor device characterized by forming n type transistor in a III-V group compound semiconductor active-layer side while forming p type transistor in this exposed field side.

[Translation done.]